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ABSTRACT

The Oregon System of Mathematics Education (OSME) is a project geared toward identifying the curriculum gap between what exists and what is desired. Its primary objective is the improvement of mathematics education for all students in Oregon schools. The needs assessment described in this document focuses on gathering opinions and attitudes of mathematics teachers at all educational levels, business representative, administrators, and parents toward the mathematics curriculum as it now exists in the Oregon school system. (Author/DEP)

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THE ASSESSMENT OF MATHEMATICS EDUCATION NEEDS WITHIN THE STATE OF OREGON

Gregory P. Thomas

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Needs assessment in the context of the Oregon System of Mathematics Education has evolved from a procedure originally described by Gage (1970) into an activity geared toward:

1. Describing existing conditions;
2. identifying desired circumstances; and
3. measures of the significance and importance of the differences between what exists and what is desired.

The use of the word need in this design suggests that gaps may be identified between what exists and what is desired. If gaps are identified it is feasible to expect these to be examined on the basis of two criteria:

1. Is the gap significant?
2. Is the gap important?

Significance in this case suggests size. When significance is considered in establishing priorities of needs, some attention must be paid to errors of measurement. What appears to be a large gap may still be within the standard error of measurement of the instrument employed. Especially when the procedures consist of collating and analyzing human perceptions, what is perceived as a gap may be found to be nothing more than a widely shared but erroneous perception.

There are two characteristics of needs that reflect importance. One is urgency. A need that is considered urgent is one that would be best alleviated by immediate intervention. A gap may have been in existence a long time growing at an increasing rate so that only immediate interventi on will be effective and efficient.

A second characteristic of an important need is gravity. Here the concern is with the seriousness and pervasiveness of the gap. Typical questions of focusing on gravity are: "Is the situation critical?" "How many persons are involved?"

Why focus on gaps?

To best understand the primary rationale for collecting data which attempts to describe gaps, it is helpful to understand the client for whom this procedure was designed.

The Oregon System of Mathematics Education (OSME) is one of two "experimental" state level projects sponsored by the National Science Foundation. Its primary objective is the improvement of mathematics education for all students within the State of Oregon. Operationally, this has been translated within the State into designing and implementing a number of and a variety of educational activities that focused on improving instructional contexts, procedures, or materials. In many instances this meant changing the teachers themselves in some way as a necessary antecedent to other changes.

Unlike activities historically sponsored by the NSF, i.e., summer workshops, institutes and academic year institutes, the activities which are supported under the OSME are designed within a particular locality and implemented largely by local people. Decisions regarding project funding are not based on the results of reviews of competitive proposals. Most activities are "found" as a result of conversations between local educators and top level project management as the latter travel to various localities in the State.

During this travel project staff are able to "sense" some problems that exist. They do obtain some concepts of what varieties of populations of State residents believe the conditions of mathematics education to be, and what changes should be made. Decisions about particular activities are made in "real time" using whatever evidence is available. The needs assessment activities described in this paper are geared toward gathering "discrepant" data which may be of use to project management in their consideration of direction setting and decision making.

Procedures

One of the most difficult decisions related to a systematic assessment of needs was in resolving "what" would be measured. For a couple of reasons it was decided to focus on perception rather than objective assessments of actual conditions in mathematics education: (1) Responses are based usually on perception of stimuli, not on actual stimuli or conditions themselves. (2) The obstacles to obtaining data for developing objectives descriptive of conditions regarding math education began to become deceptively complex. That decision proved one of the easier ones. Two other phenomena made it difficult to determine the kinds of items or measures to use in assessing perceptions:

(1) Different people saw needs as entirely different things. For example, a common response to a question regarding needs among university mathematicians was, "We need more inservice training programs for teachers so that..." Among persons in commerce the response might be, "Everyone should be able to add, subtract, multiply and divide." What this particular university person saw as a need, an individual in the world of commerce might view as a means for alleviating some need.

(2) Even when different people could agree to focus on means or ends, and could agree on where any particular statement should be categorized, they tended to talk about means or ends with different language and at different levels of specificity that made common communication almost impossible.

The first problem was resolved partly as a consequence of trying to resolve the second one. There was no way to write statements about educational means that held the same meaning for two educators, much less for a teacher and a parent. For example, ask any two educators to describe what is meant by "the discovery method." So, after considerable discussion, we focused our data collection on assessment of student learning outcomes. Outcomes were easier to express in a language that large numbers of persons representing many groups at several levels of formal education could agree upon and understand.

The issue of levels of specificity was very difficult to handle. It has not been entirely resolved yet. Through discussions held with mathematics educators, it became obvious that mathematicians have a much "deeper" view of mathematics than just an ability to compute or perform at a cognitive level. Mathematicians who were contacted indicated that they viewed mathematics as a discipline possessing much more depth and breadth than could be represented by items addressing only very specific skills. During these conversations it was also discovered that mathematicians had begun to think instructional emphasis in early grades should be shifted away from cognitive skills and toward objectives in the affective domain.

Instrumentation

A review of relevant mathematics and evaluation literature during the summer of 1972, failed to find an instrument capable of measuring what we had concluded should be measured. However, an extensive list of outcomes items was compiled. This list served as a guide in the development of the first set of items. An initial instrument was compiled and subjected to a first validity check with mathematics educators. This validity check essentially resulted in limited item substitution, addition or deletion, but a great deal of item re-wording.

The first developmental cycle which was employed attempted to validate:

1. item wording;
2. representativeness of each item;
3. relevance of each item;
4. clarity of instructions.

This developmental cycle encompassed approximately 5 months and took the instrument from an initial draft through "draft 5." No major data collection attempts were undertaken during this period of time although data were obtained in each developmental cycle. Individuals representing a number of segments of the educational framework were sampled. These included representatives from the populations of:

1. elementary principals
2. secondary principals
3. secondary math teachers
4. elementary teachers
5. school superintendents
6. math curriculum specialists
7. community college math instructors
8. college math instructors
9. representatives from business
10. parents

Sample

A relatively small number of individuals had been sampled during the instrument development cycles which resulted in the "draft 5" version of the outcomes instrument. While many of the items had been modified and eliminated, the essential format for the instrument which was employed with every draft beginning in the summer of 1972 remained the same. (See Attachment 1.)

In thinking about sampling procedures, a number of agents and agencies were queried about the availability of lists of names and addresses. It was quickly discovered that lists including names and mailing addresses were non-existent. A number of means for deriving such lists were considered, including the utilization of census tract data and private polling firms. During this period of time a list of "mathematics enthusiasts" was being compiled by a private agency within the State. The intent of this list was to identify in each elementary school building within the State some individual who could serve as a "clearing-house" for the dissemination and collection of information pertaining to mathematics. A separate list was also being compiled for secondary math teachers.

Utilizing this list of secondary math teachers, a limited survey was conducted by mail. Based largely on the results of this survey, draft 6 of the instrument was created. An attempt was then made to sample parents utilizing the "enthusiast" list as a means of contacting parents. In brief, a sample of "enthusiasts" was sent 2 questionnaires to be distributed to parents at random and a 3rd to be completed by "enthusiasts." The returns were extremely poor. It was some months after this survey that we were told that many of the "enthusiasts" who were included on the list had since moved on. At this point it was unclear whether the poor return had been due to a lack of commitment on the part of respondents or an inaccurate mailing list.

Concurrent with this mailing, meetings were held with a number of parent groups. These groups were asked to respond to the instrument "as is." Following their responses each item was discussed with questioning directed at determining whether or not the items had been understood and whether additional word changes and items should be made. The final draft of the outcomes instrument was produced shortly thereafter (see Attachment 1).

It was thought that the instrument was at a stage of development to warrant the collection of a substantial amount of data. Utilizing Intermediate Education District catalogues, more accurate and current lists of elementary and secondary educators were compiled. It was discovered that 1.2 million of the State's total population of 2.2 million had names and addresses in the Department of Motor Vehicles computerized files. It was decided that this list would serve to identify a general sample of the State's population. Table 1 presents a breakdown of the populations sampled and the return rate of questionnaires as of April 10, 1974. Because questionnaires are still being received, the data in this Table and all of those which follow should be interpreted from the standpoint of trend.

In this assessment respondents were asked to rate several statements as to: (1) the extent they considered each statement to represent an important outcome of mathematics education and (2) the extent they considered the schools in Oregon to have succeeded in helping students achieve that outcome. A rating of "1" was low, "7" high. No attempt was made to differentiate outcomes for elementary and secondary levels. All outcomes were to be viewed as consequences of 12 grades of education.

Table 1. Final Draft Outcomes Instructional Sample Spring 1974.

Group	I.D. No.	Total No. in Group	No. in Sample	% of total population	No. Returned	% Returned
General Public, ages 16-75 only	0	1.2M	3,000	.03	241	8
State Dept. of Education Top Management	1	7	7	100	2	29
State Legislative Committees	2	24	24	100	2	8
University Math. Professors	3	255	128	50	34	27
Community College Math. Profs.	4	85	43	51	10	23
School Board Members	5	2071	414	20	54	13
Secondary School Principals	6	408	82	20	25	31
Elementary School Principals	7	1024	205	20	52	25
Secondary Math. Teachers	8	1381	276	20	105	38
Elementary Teachers (excluding specialized areas)	9	5615	2500	45	483	19
TOTALS	-	-	6679	-	1008	15

Data and Discussion

Because the context elements can be controlled and the independent variables manipulated, the discussion of results in an experimental study is frequently in terms of absolutes. That is, interpretations of data can be limited to the variables examined and the procedures used. Data obtained in need assessments, are seldom subject to such rigid and certain interpretations. It is difficult to restrain the incautious from overgeneralizing by coupling needs assessment data to other information that is invariably available. Refusing to examine needs assessment data in terms of other information about the context in which they were obtained may be prudent from the scientific point of view, but such constraints may limit the usefulness of those data beyond what is reasonable. This is to suggest that the results of this assessment must be interpreted with in some unclear but reasonable limits, not trying to read too much into the results, but using other information as adjuncts to them.

The return rates of the outcomes instrument have varied considerably among the samples. At the time this report was prepared, returns were still being received, at a rate of 15-30 per day. However, few, if any, additional responses are coming from the general public. It also appears that responses from State Department of Education management staff, Members of State Legislative Committees and University and Community College Professors have closed. It is unclear whether additional returns can be expected from School Board members. Many of the mailings for this group of individuals were to school district offices rather than to home addresses. With the mailing to this group having occurred in the middle of March, it is possible that mail is being held at district offices until they reconvene in early and mid April. Returns from secondary and elementary principals as well as the secondary and elementary principals are still being received.

The number of responses to the mail survey have been disappointing. (See Table 1.) For whatever reasons, only two members of the Educational Committee of the State Legislature and two persons in the State Department of Education returned the outcomes instruments. Thirteen percent of the school board members surveyed responded. The apathy of these persons who are leaders in education was almost as great as that of the general public.

Importance Scale

A selection of importance data is displayed in Table 2. Reported in that table are the percentages of respondents above 50% in each category who rated an item with a 6 or 7. It's possible using this format to review questions which were seen by the respondents in all groups to be highly important. It is also possible to review items which only respondents in certain categories believed to be important. Because of the small N, State Department and Legislator data will be excluded from further discussion.

An examination of Table 2 reveals:

1. "Having a positive attitude toward mathematics"(Item #3)is apparently highly important to only the general public and University Math Professors.

	State Dept. of Education N = 2	Legislative Ed. Committee N = 1	University Math. Professors N = 33	Community Coll. Professors N = 9	Secondary School Principals N = 10	Elementary Sch. Principals N = 13	General Public N = 228
1	100	100	91+	100+	100+	77+	96+
2	50	-	-	-	-	-	-
3	50	-	54	-	-	-	51
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-
8	-	100	-	-	-	-	-
9	-	-	-	-	-	-	-
10	100	100	64	67+	90+	77+	82+
11	100	100	78	67+	80+	85+	84+
12	-	-	-	-	-	-	-
13	50	100	88+	89+	90+	77	91
14	100	100	97+	100+	100+	85+	95+
15	100	100	88+	100+	100+	85+	93+
16	100	-	67	78	80+	54	77+
17	100	-	63	78+	80+	61	54
18	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-
20	-	100	-	-	-	-	-
21	50	100	85+	67+	100+	93+	94+
22	-	-	-	-	-	-	-
23	50	-	64	-	70	-	62
24	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-
26	100	100	-	-	50	53	69
27	100	-	-	-	-	-	-
28	-	-	-	-	-	-	-
29	-	-	-	-	50	-	-
30	50	-	-	-	-	-	60
31	-	-	-	-	-	-	-
32	-	-	-	-	50	-	70
33	100	100	60	66	70+	-	76+
34	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-
36	100	-	60	77	60+	53	68
37	100	-	57	55	50	69+	74
38	100	100	81+	67+	90+	85+	91+
39	-	-	-	-	-	-	-
40	50	-	-	-	-	-	-
41	-	-	-	-	-	-	-
42	50	-	-	-	-	-	-

(+ - more than 50% of the responses were rated 7's)

Table 2. Percentage of responses $>$ 50% which were either ratings of 7 or 6-- or a combination (highly important) by item number and respondent group.

2. The combined ratings of 7 and 6 indicate that all respondent categories believe "being a more knowledgeable consumer" (Item #10) and "utilizing math in an occupation"(Item #11) are highly important. However, 50% or more of the respondents in all groups except University Math Professors gave those two items ratings of 7. Item #16, "solving problems utilizing measurement," received ratings of 7 from 50% or more of the secondary principals and general public respondents. Interesting inclusions and exclusions by respondent categories are also evident for Items 17, 23, 26, 29, 30, 32, 33, 36 and 37.

The statements that all respondent categories agreed were important outcomes were for the most part cognitive skill types of items. Consensus on Item 10 and 11 could be interpreted as reflecting the thrust on "Career Education" in Oregon. If curriculum modifications within the State have in fact leaned toward affective outcomes, the effects of those changes were not reflected in the responses the public made to this survey. Many math educators have recently been discussing the "revolution" in mathematics which is about to take place because of the advent of the electronic hand calculators. Their responses do not indicate that this level of conceptualization has reached persons in the respondent categories.

Success Scale

Respondents may have employed entirely different criteria in determining their responses to the "success" scale than they did in determining the outcomes they considered to be important. While everyday personal feelings may play an important role in determining how something is valued (rated important), it may be necessary for information of more concrete form to be available for respondents to justify their responses on the Success scale. Illustrative of this hypothesis is the following data matrix which indicates the percentage of "No Response" to all items:

	Importance	Success
University Math Professors	0.7%	4%
General Public	0.5%	5%

Many individuals were apparently more hesitant about rating the Success of Oregon schools in contributing to an outcome than they were in indicating the importance they attached to that outcome. The hesitancy to respond to the Success scale is itself an important data point. It would seem to indicate that dissemination of information to the varieties of respondent groups is presenting a serious and quite pervasive problem. Attachment 2 is a summarization of comments individuals included on the instruments they returned.

The most striking comparison in this Table is the contrast between the large number of items University Math Professors indicated have been unsuccessfully attended to and the responses of the General Public. It is unclear from Table 3 just how Success was rated by the General Public group. Figure 1 presents a summarization of all 7, 6, etc. responses made by the two identified groups. It can be seen that the General Public sample tended to rate success around the mid-point of the scale with 58% of their responses falling in the 2 - 5 ratings. The University Math Professors tended to

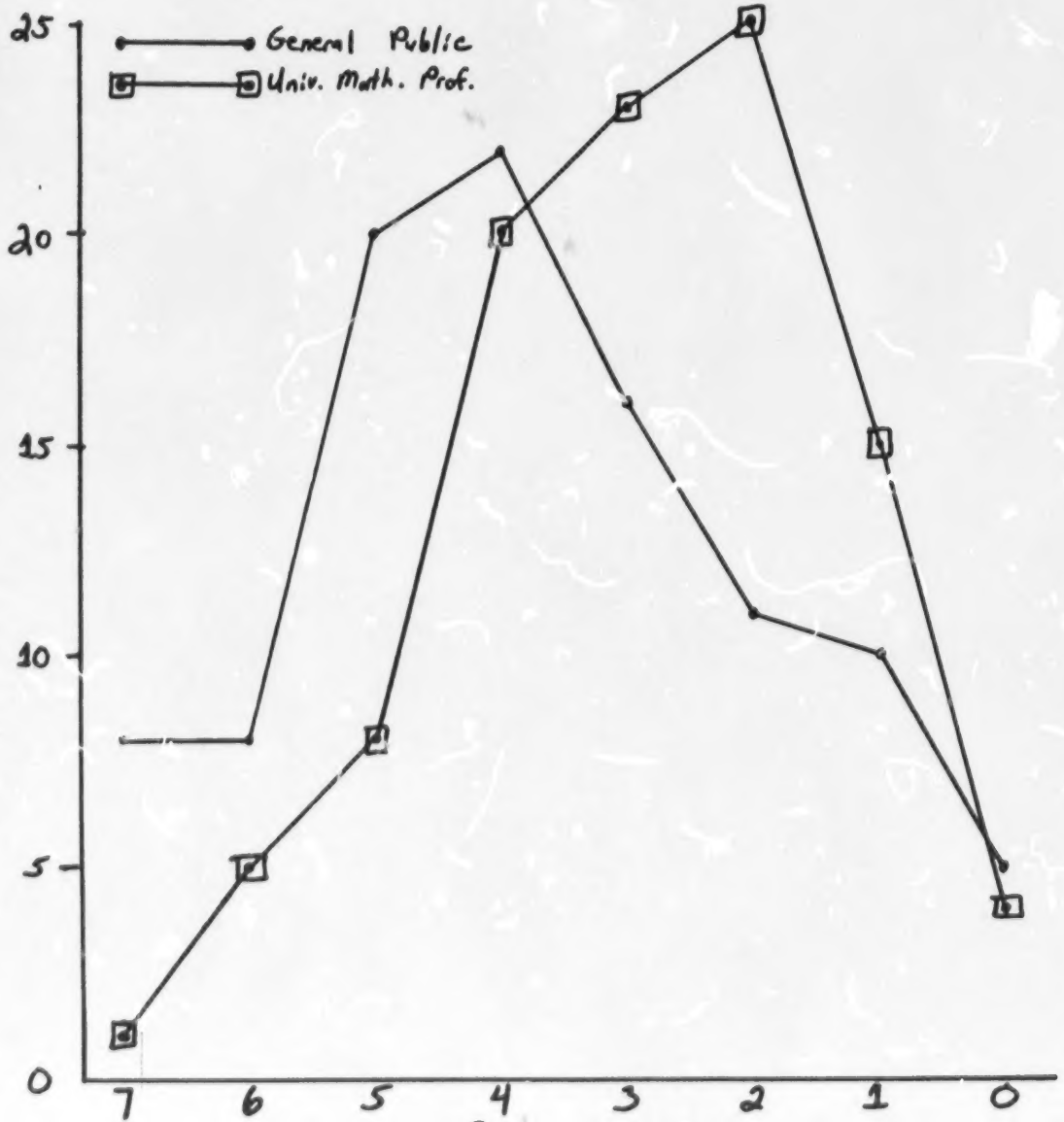
	State Dept. of Education N = 2	Legislative Ed. Committee N = 1	University Math. Profs. N = 33	Comm. College Professors N = 9	Secondary School Principals N = 10	Elementary School Prin. N = 13	General Public N = 228
1	50		–	–	–	–	–
2	50		78+	55	50	–	–
3	50		76+	68	–	–	–
4	50		86+	77+	70	61	–
5	–		52	77	60	54	–
6	50		81+	66	50	61	–
7	50		72+	55	60	–	–
8	–		84+	66	50	–	–
9	–		84	79	50	–	–
10	50		–	–	–	–	–
11	–		51	–	–	–	–
12	50		78+	77	–	54	–
13	50		–	–	–	–	–
14	–		–	–	–	–	–
15	–		–	–	–	–	–
16	–		–	–	–	–	–
17	50		72	–	–	–	–
18	50		69	55	70	53	–
19	100		–	66	–	–	–
20	50		72	55	–	–	–
21	–		–	–	–	–	–
22	50		82+	66	60+	84	–
23	–		–	–	–	–	–
24	–		–	57	–	–	–
25	–		69	–	50+	–	–
26	50+		57	54	–	–	–
27	–		66	56	–	–	–
28	50		78	–	–	62	–
29	–		66	–	–	54	–
30	50		69+	57	–	54	–
31	50		69	78	69		
32	50		60	–	50	–	–
33	50		69	–	–	–	–
34	–		78+	57	–	62	–
35	–		84+	55	50	–	–
36	50+		72	–	–	–	–
37	50		66	–	–	–	–
38	–		–	–	–	–	–
39	–		57	–	–	54	–
40	–		66	–	70	54+	–
41	–		63	–	50	68+	–
42	50+		81+	55	70	54+	–

(No responses provided on ratings of success)

(+ - more than 50% of the responses were rated 2 + 1)

Table 3. Percentage of responses $>$ 50% which were either ratings of 3 or 2 or 1 or a combination (unsuccessful) by item number and respondent group.

Figure 1 - Overall ratings of Success in percent.



rate Success considerably lower with 83% of their responses falling between 1 and 4. It is unclear what the specific sources of data the various respondents utilized in making their ratings. It is clear that the General Public assumed a very "neutral" posture while the University Professor sample tended to be much more extreme in their responses.

Comment

It would appear from the data summarized to this point that:

1. There is some difference of opinion between respondent groups in what's considered to be important.

2. Items which are agreed upon as being important reflect what is "typically" thought of as a mathematics curriculum (+, -, X, ÷, % and fractions)

3. If a curriculum modification has been made in public education the response would tend to indicate that the respondent groups haven't adopted the same things as important.

4. While many educators in the State seem to feel that hand calculators will substantially change mathematics, the respondents didn't find these innovations to be especially important.

5. The General Public doesn't appear to have sufficient information to make other than a "neutral" success response possible.

6. The extremely low success responses provided by University Math Professors also suggests some questions as to the basis for their response.

Gage G. and Birnbaum, M. A model for establishing a priority of educational needs. An unpublished position paper, 1970.

ATTACHMENT 2

Unedited comments provided by questionnaire respondents.

ELEMENTARY SCHOOL TEACHERS

Written comments concerning the success scale:

- For all students can only make a wild guess.
- I cannot assess the success of the mathematical program at grade level 12.
- I cannot honestly respond to the success column even at a personal level since I learned much of the math I know in my work.
- I cannot do this. Perhaps a high school math teacher could for his own school but statewide is an impossibility!
- I really don't know what success Oregon schools have in these lines after grade 12. I believe Oregon schools have done a good job in math in most areas.
- I have no way of knowing Oregon's success in any of these factors.
- I teach grade 2 and am sure what I think students should know in math; however I have very little contact with grade 12 and am not competent to say to what degree goals in math have been reached. My guess that the "success" would be low for all except the "above average" who chose to further their education in math.
- My ability to adequately fill this out is greatly hampered by lack of knowledge of what's happening much above my level (2). Therefore, my responses are colored by my own experiences in math when I was a public school student.
- I do not feel I am able to judge the success column since I have little contact with grade 12 children.
- Don't know!
- Have had minimal contact with Oregon's H.S. graduates. Therefore feel I should not answer part two of the questionnaire.
- I don't feel I can accurately judge this since I teach 7 year olds.
- I would not attempt to judge the success of Oregon's math program by the end of grade 12, as I'm not at all informed in that area. I would say we're "lacking" at the elem. level, however.

Written comments concerning specific items:

Item	Statement
8	not clear
11	Where called for.
11	To the extent necessary to function.
13, 14, 15, 16	The pupils have been taught these concepts but fail to commit to memory the tables of + − ÷ x thru 12.
15	Should know both systems at least aware of metric.

Written comments concerning specific items - Continued

Item	Statement
17	They (students) learn this in real life.
17	IQ. 20
18	graph 7-6
19	statistics 2-4
25	not sure I understand
25	This statement doesn't have a lot of meaning to me.
30	Not sure this is entirely due to teaching.
30	Logic.
32	What is it?
33	Related to #17
33	#17
35	Bla!
37	Transition from story problem to formula is not being presented effectively.
38-42	All depends on your vocation or your need of these instruments.
40,41,42	For college bound or those entering work that requires this skill.
40	at what age or level?
41	when available?
41	Depends on income bracket whether this would be practical or not.
42	Who does know?
42	Garbage in = G' out
42	If a students field is this - Imp. would then be #7.
42	As general knowledge.

Written comments of a general nature:

- My "reactions" in the "importance" column are based on what I would consider to be important to function as an "average", "well-rounded" member of society in general as a consumer and a family member who will assume responsibilities in many general areas.

- Hard to mark. Each child is different--different goals, degrees of success, etc. Difficult to generalize.

- I have no knowledge of what math skills high school students have!

- I am shocked at this survey! You are asking for my opinion which may or may not be worth anything. But worse, you are asking me to make judgements when I have no base to make them from. I have no idea how successful the schools have been.

ELEMENTARY SCHOOL PRINCIPALS

Written comments concerning specific items:

Item	Statement
40	We are here, but most schools aren't.
41	Eventually

Written comments of a general nature:

It is obvious that this questionnaire is made out by math majors. You people measure everything by math and give we lay people the feeling that nothing else matters. There is a lot more to life than just Mathematics. P.S. I just had to get this off my chest.

UNIVERSITY MATHEMATICS TEACHERS

Written comments concerning specific items:

Item	Statement
5	Additional to what
10	If we mean "more" than the present state, success must be 1--if more than previously was the case, it depends on what point in time we refer to.
21	Obviously more success than your success in designing meaningful questions.
23	Comparing to what.
32	What is the basic function or role in math?
33	Estimate of what? See #17
36	At their level of use--which is what.
40	Gairing in importance

Written comments of a general nature:

- Questions too vaue to answer in a meaningful way. Some schools excellent; others poor. Most students take too little math in high schools. This is not the fault of school math departments, but rather of advisors, and live to regret it when needed in college.

- I do not have any knowledge of how Oregon is doing, unless it is in computers--you may have to throw this questionnaire out.

GENERAL POPULATION

Written comments concerning the success rating:

- I do not have any dependable information concerning the success of Oregon schools.

- Catch here is the "each person." Beyond practical use, math is a specialized subject for those with special aptitude for it. Measured as such the "success" ratings would change.

- I didn't rate this column because I'm not familiar with the Oregon school system.

Written comments concerning specific items:

Item	Statement
2,3,4,5,6,7 8,9,12,22,23 24,25,26,27,28 29,31,34,35	These are important to computer programming or someone going into this work. However for those stopping at 12th grade it is not important. With all the new Math. programs we have forgotten to teach them how to write a check, budget, compute a 15% tip, interest payments, time buying and 2/3 yd. of material when the price is by the yard.
2,3	Very poor in schools! (esp. with girl students).
5	Depends on field they go in.
8	Define interesting
10	Doing better than previously
10	Not qualified to answer
10	This is only <u>partly</u> a mathematics education job, tho
10	Not in math. (Try Social Studies).
13	I have a "high school diploma" but cannot do fractions, long division and cannot write legibly. Also read very poorly. How do I know? My prospective employers told me so. I joined the navy because I couldn't get a decent job. Thanks to your present education program, I am an "illiterate" in the present business world.
15	Needs both
22	What artistic properties
24	This question not clearly stated
32	Basic
34	Extremely important
40	I've found myself after 2-3 years using a calculator, depending on it too much and forgetting how to work out these same problems myself.
40	computer - cpu w/ related drives and equipment.

Written comments of a general nature:

- You repeat and overlap too much.

- I have a second grader and a 5th grader. Judging from them and their classmates Oregon math could <u>improve</u>. These new math concepts seem to confuse--then after they are thoroughly confused, the schools teach the "old" way and say they will be using this "old" way for math the rest of their life. ugh!

Written comments of a general nature - continued

- Please Note: You leave no box for comments. Very bad from a psychological point of view. How can I validly express the success of Oregon schools when we neither have children of our own--nor do our friends send their children to public schools? I suppose you will discount my opinion because I didn't fill in the success box.

- These are my son's actual comments. I'm sorry but am forced to agree. The present system of grade school, Junior High and High School is a dismal failure. I made a special long distance call to my son to get his response to this questionnaire. These are his ratings of questions asked. As a parent, and also as a businessman and employer, he is only one of many of hundreds of students graduated on a "High School Level" that cannot read, write, or do mathematics above a t hird grade level.

  P.S. Would appreciate your comments on any plans for correcting this condition.

  (Name and address included)

- My children are aged 10 and 8, so some of these questions I can't answer yet. And I went to school mostly in Texas and Alaska, so I can't draw on personal experience.

- Perhaps "Old Math" should be reconsidered if "New Math" has not shown favorable results.

- Our kids are in real trouble if and when we move back to the East Coast.

- Some old lady teachers harm future math potential. Most students are scared of math.

- I attended Oregon schools for 12 years even though I am now living in Calif. I feel that something should be done to make Math easier and more understandable to your poor-average student.

SECONDARY SCHOOL PRINCIPALS

Item 23 Have you stopped beating your wife?

General

- I.D. number - hardly anonymous
- Not clear--is "success" rating dependent of my "importance" rating or if it is independent of "importance" rating why state that the schools have "failed" if students have "failed" to acquire the outcomes (sic).

COMMUNITY COLLEGE MATHEMATICS TEACHERS

Item 10 Math background alone would bear no fruit

Item 32 If this means to PREDICT.

General:

- EACH (in lead statement). This may be the wrong word as the EXISTANCE of those INCAPABLE is to be considered. Hence, MOST people should:

LEGISLATIVE - EDUCATION COMMITTEE

Success -

No exposure to young people sufficient for meaningful judgement.

STATE DEP'.RTMENT OF EDUCATION

In relation to anonymity -

Then why the number?